

AVIATION

The Oldest American Aeronautical Magazine

NOVEMBER 10, 1928

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VOLUME
XXV

Special Features

Dressing Up Aviation
Marking Our Airports and Airways
Air Mail and Transport in Australia

NUMBER
20

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in Flying

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AVIATION

The Oldest American Aeronautical Magazine

Vol. XXV

NOVEMBER 19, 1928

No. 20

Air Races

THE value of air races and cross-country tours is almost universally accepted. These events scheme inevitable publicity, they help the sale of airplanes, and the competition undoubtedly helps to stimulate advance in airplane and engine design. It is regarding the latter point about which there is the greatest amount of discussion when it comes to air races. Should races be limited to strictly stock designs which have formed the major portion of aeronautical construction for a period of time, or should they represent the advanced designs?

Inefficient effort has been applied to defining a stock model, but a committee which really gave the matter serious consideration could draw up rules which would assure one that the planes and even the engines were the as near as those which had been sold to the public during a stipulated period of time. The question is, whether this should be the case. Racing, which means high speed and high speed alone does not bring out all, or even the majority, of the qualities which make a good commercial airplane. Too much emphasis on the racing of stock models might turn toward the development of a plane which would not possess the best commercial characteristics.

On the other hand there is real value in racing. The Pulitzer races undoubtedly have a far-reaching effect upon the design of commercial planes, and engineers who have been trained to study the effect of entry into data in relation to speed will undoubtedly hold faster commercial planes than engineers who have never considered the element of speed. Racing the presents more opportunities for originality of design, as radically new ideas, which could not be incorporated in a design that was intended for immediate production, could be given a thorough test. If a plane fails to live up to its original design, which might be of real value if incorporated in a commercial plane. Briefly, racing as such is a form of good will advertising which has a real pilot, and in addition, it stimulates design progress. With the growing prosperity of the industry many manufacturers and private individuals will find it worth while to develop special racing planes. Speed contests between such planes will be of real interest to the public and if certain limitations are set on how fast these planes may fly, it will be no expense to build and in the long run will pay off in great value.

From the public standpoint there is no room for strictly commercial planes, or nearly commercial planes, are not very interesting. However, when the planes are absolutely stock models, an exact duplicate of the manufacturer's production lines such races are not valuable to the industry. It is possible, of course, for men members of standard production planes to obtain the much desired extra speed by using different wing sections, reducing the frontal area and using small wheels and different landing gear, etc. But it is not fair to consider the result as a commercial product or as a guide to the relative speed of the strictly stock job. It is competition between strictly

stock products that has a real value not only to designers but to future purchasers as well. As a matter of fact, racers should not be put open season. Much as the National Air Tour rules have been criticized, these annual races bring out many characteristics of the competing planes. And if these rules were applied to planes of similar size and general type they would be of real value. Separate contests for rate of climb and fast acceleration would also be helpful.

It is the opinion of the writer that the obvious solution of the problems that have come to the front in regard to speed and other forms of competition would be to make a definite distinction between stock model competition and fast-for-all speed contests. Both have their place and value, but are essentially different and therefore should be recognized as such. Public competition is one of the most effective methods of insuring progress, and the difficulties encountered during the contests held this year should not be allowed to lead us to the economic value of such meetings.

Roman Roads

MOTORISTS who travel through Italy, France and England ready step to consider the fact that the roads over which they are passing were developed primarily for military purposes. Yet, the beginning of overland transportation, which opened up European markets was made possible by the network of highways which the conquering Roman armies had found necessary to construct and develop for military use.

Todays the world moves even faster and we are already beginning to forget that antecedence, as we know it yesterday, and was almost entirely the work of military forces, and that its primary purpose was not and not commerce, it may have been within the last two or three years that large cities developed when these roads, but the influence of these early developments is most remarkable even today. Some of the cities in Europe are good ones, but they will probably continue to exist in memory.

An interesting example of the close relationship in the steady evolution of the Army and Navy's last aeronautical men into the civilian field. In the matter of piloting and the matter of engineering the military services are acting as educational institutions for the training of men who will be capable of taking their rightful place in civilian aviation, who have been in the engineering department at Wright Field in order to obtain a certain aviation education. If there are any left to do the military work. At first glance this drawing of the military personnel would seem most helpful to the services, but as a matter of fact the personnel is mostly being transferred. The Army and Navy are weaning their trained men into the service of commercial aviation, and in the case of a national emergency the civilian industry will be full of men who have had military experience and are familiar with military requirements.

Air Mail and Transport in Australia

By MAT. NORMAN BRADLEY

Montana Resources, Inc. (Montana Resources, Inc.)

AIR mail and transport service in Australia is but seven years old. In these seven years, however, extremely rapid progress has been made. There are now three companies, operating planes on regular schedules, connecting towns which cover a total of 4,800 mi. A contract has been let by the Commonwealth Government for an additional 1,500 mi. of air mail route to be opened in April, 1938, and negotiations are underway for still further expansion and development.

The growth of the "mail route," as we know it in Australia, may be attributed in part to the subsidies paid the contracting companies in several different states. On the other hand, the support of the public has since this era rated the present development. In some states, the mail service has brought the first regular and frequent deliveries of mail. This is especially true of the small townships along the northwestern coast of Western Australia, where 40 per cent of the mail is now carried by air. Ordinary mail for this section of the country is transported by contract steamers, which are erratic and comparatively slow.

In 1927, West Australian Airways, Ltd., began the operation of the first air mail and transport line. This line extends from Perth, which is the southern terminus and is where the headquarters of the company are located, up the coast to Derby. Stops are made along the way at Geraldton, Carnarvon, Onslow, Rockingham, Whiteman Creek, Port Hedland and Broome. The air-line distance of the entire route is 1455 mi. The route is made generally in two



Side view of a 14-passenger Delftseiland "Hercules." On the new Porth-Adelaide route, planes of this type, equipped with three "Jupiter" engines, will be placed in service.

last year. The second year, however, a steady growth was noted in the number of letters carried, and at the close of 1923, the average monthly rises to 10,000 a month. Late in 1925, the monthly average had increased to 15,000, while in the last six months of 1925 the average number of letters carried by plane was 20,000. Since that time, the number of airmail has continued to increase. Carried originally from all parts of the world it is carried regularly to the United States. The cost of airmail is three times that of surface mail, and the cost of airmail has increased in each year. In addition to the cost of regular postage, the Postal Department offers an express passenger delivery upon payment of ten cents extra for each letter.

The passenger traffic on the line has been consistently good, in spite of the fact that the fares are from two to three times as great as those charged for slower passenger traffic is growing, and the normal load having passed, we expect to experience more engine and traction parts, mechanics, drivers, engineers, goods, and many other things that are required for the regular car necessities. It is not unusual for an automobile to run, costing several pounds, to pay more than its value in freight, but to save its weight several times its value as a result of the speed of delivery.

The townsships along the route, the distances between them, the passenger fares, and the parcel rates per pound are as follows:

and one-half days although it can be flown in 36 hr. An extension from Derby to Wyndham by way of Flintry Crossing and Hill's Creek is proposed, which will increase the total mileage to 2,006.

The rail service offered by the Perth-Derby line was not particularly well utilised by the public during the

From	Distance	Time	Passenger Rate
Perth to Derby	1455 ms.	.228 On 04	... 08
Glenside to Caversham	270 ms.	.410 10s 04	26 04
Glenside to Grawley	510 ms.	.415 15s 04	26 04
Glenside to Radnorshire	675 ms.	.418 04	34 04
Glenside to Port Head			
London	775 ms.	.418 On 04	... 08
Glenside to Bromley	1985 ms.	.522 04	34 04
Glenside to Derby	1195 ms.	.418 04	34 04
Glenside to Caversham	260 ms.	.415 25s 04	18 04
Glenside to Radnorshire	625 ms.	.410 10s 04	26 04
Glenside to Bristol			
Bristol	1000 ms.	.418 04	34 04

Passenger may take 43-34-04. Coming from Paris to Gerolstein, or vice-versa, the excursion rate is 45 on 0d. For a round trip, the full fare is charged for the forward journey, while there are reductions on the return fare if it exceeds 110. If the passenger returns within the week, there is a reduction of 25 per cent; within two weeks, 40 per cent; within three weeks, 50 per cent; within four weeks, 50 per cent, and within five weeks, 10 per cent. Each passenger is allowed 20 lb of baggage. Luggage is charged for at the rate of one shilling per pound, or as much of either 'leading' or 'trailing' a pound, if used. If it becomes necessary to reject other

Our "COA" Policy

Freight may be made "wholly payable on delivery," or "C.O.D." from Perth to the northwest townships. The ordinary freight rates are charged for transporting them, and in addition a commission is collected. For a parcel with a value of under one pound, the commission is nine cents; for a parcel valued between one and two pounds, the commission is one shilling, threepence. Over a two pounds valuation, the commission increases at a rate of threepence for every pound or fraction of a pound.

The rate of subsidy originally fixed by the government for the operation of the Perth-Derby line was four shillings a mile, but after three years of operation, the subsidy was lowered to three shillings, threepence a mile. Government auditors inspect the books regularly, and productions of subsidy are fixed as a result. The contract with the government on this line is for a period of three years. The type of plan in use at the present time is the

(Continued on page 1536)



Marking Our Airports and Airways

By ARTHUR S. FORD

AMONG the many urgent problems awaiting the aviation engineer is that of establishing and maintaining constant communication between the airmen and the terrain over which he passes.

Communication has developed so rapidly that the present and prospective needs of airports, emergency landing fields, and air routes has necessarily lagged far behind the requirements. Omission of the skeleton equipment of the main road fields and with local lighting and marking as may be provided at the various airports, America, today, is practically an uncharted and unmarked country.

It is only necessary to consider for a moment the splendid and systematic marking of automobile routes throughout the entire country to understand what an enormous task awaits the aviation engineer in establishing and maintaining day and night signals to guide the aviator, and in providing means of continuous communication with him while he is on his way.

The automobile, during its drive from New York to Portland, Me., need only follow the blazed trail marks, which appear on sign posts and telegraph poles, almost every mile of his way, in order to trace his course with assurance and speed. It is evident that he need stop or slacken his speed for information, for it is spread broadcast along his path.

Will Have Complete System Eventually

It will be many years, of course, before the aeronaut can hope for so thorough a system of air signs, but it is just as obvious that such a system must eventually prevail, and it may be worth while now to try to familiarize the reader, at least, on which such a comprehensive system must be based.

First, let us examine just what are the essential features of the problem of air marking, signalling and guidance. The aeronaut travels from town to town, and beyond identifying each town as he enters or leaves it, naturally an obvious and simple matter, the only essential is to direct him from the town he is leaving to the town which has next objective. As he proceeds on his indicated route, other necessary and useful information is required to him by signs indicating dangerous hills, railway crossings, or other hazards that may confront him.

In the case of the airmen, when it comes to plotting and paring the trail between two objectives, the conditions are entirely similar to those of the motorist. Under the same conditions, the aeronaut can practically fly a line from point to point. That is, his course may deviate from the straight line when regarded as a whole, but in essence the most direct flight involves itself into a series of flights in as nearly a straight line as possible from one

point to another until the end of the journey is reached. The airmen, therefore, as not a pathfinder but a navigator, and if we abandon the comparison to the motorist and think of him as the consumer of the route, then, that we can more easily remember the lines of travel and the needs.

In the first case, it is obvious that the accuracy of his astronomical bearings is of prime importance, and the compass points of the place he leaves, the place he flies, and the place he is destined to are essential. Now, while it is true that his place is preceded with the head-down scientific aids in his compass direction, yet experience has

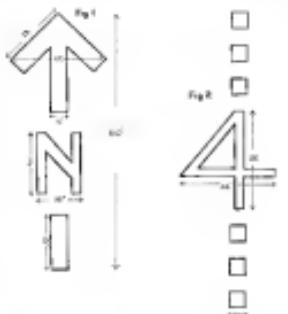


Fig. 1. A north pointer adopted as standard by the governmental authorities. Fig. 2. A route marker.

proved that the conditions obtaining in the air, under even the best conditions, render it far more difficult for accurate compass readings than on land, and the prevalence of frequent and lengthy compass checks on the ground is a natural consequence.

Again, the markings of the trail itself must be afforded from the ground, and those trail or route marks must, as far as possible, be easily distinguished by night as by day and under conditions of poor visibility as well as in clear weather. There are many other essentials, however, in any thorough system of air marking. For instance,

there are the two important factors of identifying each locality by name and denoting in a simple and legible manner the distances and directions of other respective points.

The problem of marking and identifying an airport town, or route, is not as simple as it may at first seem. Any aviator who has traveled a 60 ft road from a distance of 10 thousand feet will agree that the reading of a letter of less than 20 ft in size will be difficult to read at any altitude. Again, the largest letters cannot be read

greatly visibility, however, as it tends to blot the signs from any cockpit with its surroundings.

Again, the authorities recommend that this sign, as well as all other ground signs, shall be illuminated by a self-contained lighting device rather than relying on the use of flares, lights, which are more expensive to install and maintain.

Fig. 2 shows a series of route marking which indicates the path of route A. It is obvious that this dotted line can be given any desired color to avoid confusion, just as the blue or yellow plane on a telegraph pole by the roadside guides the travelling motorist. The dotted line effect shown in Fig. 2 is obtained by the use of unit blocks designed to reflect the light upwards by day, and they are provided with unit lighting by night. Advantage is taken of the tendency of insects to fly toward light sources from all sides, and these units, therefore, are spaced apart as shown, thus saving installation cost and maintenance charges.

When it comes to providing means of identifying the airport or town, the question of the size of the letters, the method of lighting, and the cost of the latter item, all must be carefully considered. As before stated, any letters of less than 20 ft in size must be regarded as inadequate, and the government recommends letters of at least 25 ft. dimension. This practically bars the use of hangars, or other such, as suitable places for the erection



Fig. 3. This illustrates an airport sign exhibiting the unit type letter blocks.

in the dark, so provision must be made for their proper illumination at night, and here the cost of illumination becomes an important factor.

Outside of the purely governmental fields, airports are subject to the same requirements of any other business institution. They must operate at a profit, or they cannot continue in business. For that reason, the directors of such airports are anxious to have the same as other business heads have learned from experience, out of the great airports of which is this, however efficient and attractive their place of business may be, yet it is necessary to mark out in all directions to attract and lead the traveler to their doors.

The name of an airport is the "sign over the door," and just as the country hotel or road house finds it profitable to letter and bill the country around it in so far as to make so the prudent airport director will take steps to inform the vicinity of its proximity several miles before it comes in view.

The question of radio posts and sign posts will naturally be raised and this leads us to the very important remaining classification of signs and signals for the spreading of accurate wind, weather, and storm information to the airmen.

Sign and Signal Data Basic

The foregoing sign and signal data may be regarded as basic and necessary over every part of the country where there is flying, and the only remaining question to be answered is, "What do we do?" In the first place, the signs for intercommunication between the ground and the airmen, which will give with other information and advice as may arise from time to time and which does not fall within the scope of the foregoing angular needs.

Reverting to the foregoing analysis of basic marking needs, let us take them up in order and consider the best and most economical methods of imparting the necessary information to the airmen. First, let us consider the ground compass. Fig. 1 shows a north pointer adopted as standard by the governmental authorities. Here we have a broad arrowhead pointing upwards and a horizontal line shown as the scratch the dashed framework of this device with a 60 ft by 60 ft over all. The Government does not specify any hard and fast rule so as to its construction, its material, or its lighting mechanism, but does recommend that by day its color shall be chrome yellow, as that has been found by experiment to possess the

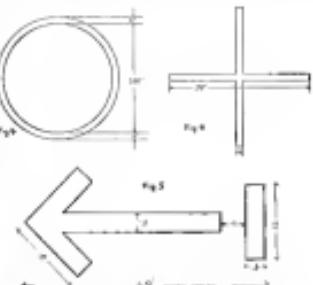


Fig. 4 shows the 100 ft circle used for marking airports. Fig. 5. A standard airport pointer. Fig. 6 illustrates the accepted marking of an emergency field.

of initiating place letters. In Europe, airport signs are generally placed upon the ground, and that course is far preferable to any other method.

Presumably every airport has an available space either on its own grounds, or next to the field, where an adequate sign can be erected and operated at a reasonable cost. There are two better ways for such a sign than a set of block letters, and on this background the letters can be erected horizontally from any suitable material, and supported in any convenient manner. If it is desired, unit type letter blocks can be used, as with them, any desired words can be spelled out by disposing them on the black circle board, just as children's building blocks can be arranged in any desired pattern.

In Fig. 3 is shown a unit letter sign made by this

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The California Aircraft Operators' Association

By CHARLES F. McREYNOLDS

INDIVIDUAL operators of commercial aircraft throughout the country, for some time, have been considering the problems of operation, those of cost finding, and those of determining the relative values of various types of ground and flying equipment, as well as the many other difficulties which it is almost impossible for any one organization to solve alone.

Presently in Southern California, the need has been felt to have a group of individuals discussing operating problems. Thousands of persons have been flying in all types of airplanes and many different routes, here in the southwest. Methods of operation, the fees charged and the equipment used have varied widely.

No one has been able to find just what incentive offers the best investment, just what types planes actually are the most profitable, and just what type and vehicle of advertising is the most productive of results. What is more, there has been no way of disseminating, for the good of the others, any special knowledge that certain groups of operators may have obtained.

Southern Business Acute

The situation finally became such that after much consideration by several of the leading operators, a meeting was held, and plans for the formation of an association were presented. When the actual organization meeting was called, 14 of the 47 operators in Southern California were present.

The California Aircraft Operators' Association, as the organization is known, was formed for the betterment of its members, as a means of increasing the use of air transportation, and for the development of an association on the part of the public of many instances of aircraft safety and progress. The association will be incorporated as a non-profit, dues-based corporation. All relevant advanced and information, gathered for the use of its members, will be available to them only.

Although the association of operators in Southern California are intent on charter flights, the original 14 inside many of the largest and most successful operators of commercial aircraft. Furthermore, there is every indication that within a very short time all other eligible operators will find that they cannot afford to remain out of the association. Southern California will then be able to consider the views of the association, as representative of the aircraft operators, on all questions of legislation or public policy. Following the constitution of the Southern California club, it is hoped to immediately extend the association to cover the entire state of California. Thereafter, the association can cope with all the problems of commercial flying.

In this with the attempt that is to be made to solve all the problems of aircraft operators, a paper on the con-

positive cost of operating various types of flying equipment will be read by one of the members at the organization's first meeting. Thereafter, meetings will be held every two weeks. A new problem will be discussed at each gathering. A monthly bulletin, containing statistics, operating data, and discussions of vital problems by members of the various operating companies will be published for the guidance of all members.

It is felt by the operators, that this interchange of ideas will greatly standardize methods of aircraft operation, and will place flying as a real business basis. Certainly,



Flight picture of the Ryan cabin plane operated by Texas Pacific Coal and Oil Co. The plane is the product of the Moulton-Ryan Aircraft Corp., one of the charter members of the California operators' association.

the uniform treatment of certain problems and conditions, such as hours of flying, fuel economy, pilot qualifications, passenger accommodations, and so forth, will have a most beneficial effect upon the flying public. The association is to go further than the exchange of ideas and data on common problems. They have and do plans for the establishment of a central bureau, which will actually carry on business negotiations for the members.

Certain of the operators will plan, while others specialize in flying certain of one type or another. A member may not find what he wants if he approaches one operator only. He may be discouraged, because a plane is too expensive, or is not large enough, or because the cost in flying is burdensome to his needs, or the cost is beyond his purpose. But anyone knowing the general nature of the association will have the opportunity to choose for himself, that which is best suited to his needs. From the central office, of course, the customer will be referred to a certain member of the association.

(Continued on page 1310)

Dressing Up Aviation

A Discussion of Showmanship as Applied to Aircraft Operation and How it Will Increase Public Confidence

By DONALD KELLOG

Aeronautic Branch, Department of Commerce

SEVERAL years ago I stood at the rail of the Los Angeles to San Francisco night boat, "Harvard," watching preparations for departure. We were scheduled to shove off at 4 P. M. At 10 a. m. in four o'clock, the gangway was still in place and two lines held the ship to the dock. A behind passenger could still have boarded the vessel.

At precisely 4 o'clock, an officer blew a whistle and a dozen men hurried about the ship. The gangway was jerked free, the two leaders hauled out of the ship, the passengers went half speed apace, the lines snared a dozen men and three long-stemmed sailors began to push the stern out to mid-stream, and the ship's orchestra, strummed on the propaneide deck, began playing a lively air.

All this and several less striking activities at the sound of the officer's whistle. A passenger dashing up at me second after four would not have been able to get aboard.

This was high class showmanship, of course. The ship might easily have been started under way without this rather stirring exhibition, but the effect of showmanship was to have been great. The departure was expeditiously arranged. Whenever I think of that trip, that "happy voyage" comes first to my mind.

There are many who will probably say that aviation is not enough advanced to apply these methods to it, but the application of showmanship to aviation, particularly to its passenger service, could set us bring about a very favorable reaction and build up a much needed confidence in the mind of the American public.

A Good Example

Two years ago, an experimental airline and passenger service was started between Philadelphia and Washington, and later on engine cabin planes. The planes were started in service, and the field strengths at each stop were instructed to perform their duties in a brisk, efficient, though courteous manner. Special loading platforms were built, ones which the planes were to land, hang-gates were then swung out against the planes so that unloading and disembarking passengers would be borne from the danger area near the propellers.

Embarking of passengers and loading of baggage was done as rapidly as possible, and when the plane was a carrier-plane, there was no question of passengers that could interfere in the minds of the passengers and the controllers. The Philadelphia Rapid Transit later discontinued this line, which they had inaugurated as an experiment during the Sesqui-Centennial, but it left a lesson, which some of the present air transport companies might well consider. A few have already adopted similar methods, but at many unusual airports there is an apparent lack of system that does not inspire trust in the heart of the man who has never flown.

A business man who recently traveled over several



One of the Ford, three-engined, all-metal monoplanes operated by Madoff Air Lines making a landing at the Long Beach, Calif., Municipal Airport. The headquarters of the California line are in Los Angeles, always in the United States told me of his impressions of the service at various points.

One night I was waiting to take passage on a plane to New York. The plane was standing out in the field when I arrived, and two or three mechanics were working with the engines. They may have been making only minor adjustments, but I recall hoping that they would not hurry through with any necessary repairs just to have the plane ready on time. Probably it did not occur to them, or to their operations manager, but if they had chosen to make a good impression they would have made those adjustments in the shade of a hangar, bringing out the plane only when it was ready to go.

After a few minutes one of the mechanics climbed up into the pilot's compartment and started the other men to start the engines. It developed that he was the pilot. I decided that after seeing him don a leather jacket and put on a helmet and goggles, I couldn't help feeling that I would have had a little more confidence, if he had come out of the flight office and taken his post like the captain of a ship walking onto the bridge of his vessel. That may seem far-fetched, but things like that are important in building up confidence, and confidence of air passengers cannot yet develop until that confidence has been built up.

The plane was due to leave at a certain time, but when that recorded came, the pilot was still warming up his engines. The passengers entered the cabin hurriedly, taking advantage of intervals when the engine on the entrance side was idling. One or two had their hats blown off by not being quick enough. Another was almost walked into a propeller. Someone shouted at him and stopped him in time, but he began the trip with a case of nervousness instead of being in a pleasant frame of mind.

(Continued on page 1310)

Airmaster Monoplanes

*Ohio Aero Mfg. Corp. Soon to Start Production on Two New Models
One Carrying Two and the Other Three Passengers*

PRODUCTION will be started in the near future by the Ohio Aero Manufacturing Corp., Youngstown, O., on two types of Airmaster cabin monoplanes having the same general dimensions but different power plants, seating capacities and weights. The first of these planes to be completed and test flown is known as the "Youngster" sport biplane, while the second is to be known as the Airmaster. Both are externally finished, high wing monoplanes of conventional design and construction.

The first Youngster is powered by an 80 hp. Anzani engine and gave evidence of remarkable maneuverability and speed in the test flights. With full load it attained a speed of more than 140 mph. and a landing speed of 42 mph. The service ceiling is 8,000 ft. The production power plant for this model, however, is to be the LeBlond five cylinder 60 hp. radial aircooled engine. The Airmaster model is to be powered with the seven cylinder 90 hp. LeBlond engine. Two additional Youngsters and one Airmaster model are now nearly completed.

The Youngster has a wing span of 32 ft. 9 in., an overall length of 22 ft. and a height in landing position of 7 ft. 1 in. The weight empty of the Youngster two place plane is 720 lb. and the gross weight 1,300 lb. The Airmaster, which is a three place plane, weighs 850 lb. empty and has a gross weight of 1,500 lb. While these figures are based on the planes powered with LeBlond engines, other new productive power plants may be used without altering the main structure.

Airmaster planes are the result of three months of experiments and construction by the company under the direction of Jim Yelton, engineer, who has been working with aircraft for the past seven years. Design features were checked by Dr. Alexander Kiensch of the Daniel Guggenheim School of Aerodynamics, New York.



A view of the wing fabrication department in the factory of Ohio Aero Manufacturing Corp., Youngstown, O.

University. The planes have been designed to meet the requirements of the national airplane owner, the flying club and the executive who uses air travel exclusively as a business.

Stainless steel is used in the wing structure and ribs of trans construction are nickel and plated to the spars. Compression ribs are built of steel tubing and double wires are used in the internal wing bracing. The leading edge of the wing is reinforced with sheet aluminum and is very light and rigid. The trailing edge is formed by a duralon.

(Continued on page 1508)



A front quarter view of the new "Youngster," two passenger cabin monoplane.

The Velie Model L-9

Velie Motors Corp. Starts Production on a New Nine Cylinder Radial Air Cooled Engine Developing 180 H.P. at 1900 R.P.M.

PRODUCTION was started recently by the Velie Motors Corp., Toledo, O., on an aero nine cylinder engine, a 9-cylinder radial aircooled type developing 180 hp. at 1,900 r.p.m. This engine is considered completely in the Velie factories and is especially designed for use in four place planes. After 100 hr. of block testing the first engines were installed in various planes, including the Travel Air and Monocouche, the latter being a four-place cabin monoplane developed by Monocouche, Inc., a subsidiary of Velie Motors Corp. The Monocouche attained a high speed of 125 mph.

The L-9 is of conventional design, having the same radial cylinder with an accompanied rod drive and a flywheel. It develops 180 hp. at 1,900 r.p.m. and 180 hp. at 1,200 r.p.m. according to the manufacturer's specifications. The weight dry is 477 lb., which is a 245 lb. per hp. The overall diameter is 43 in. and the length si-



A front quarter view of the new Velie, nine cylinder radial air cooled engine, which develops 180 hp.

The cylinder head is a Lyman aluminum alloy casting with integral cooling fins and a dome shaped combustion chamber with two Champion spark plugs diametrically opposite, one in the front and one in the rear. Aluminum intake valves are sharp into the head for the intake pipe while the exhaust valves of high temperature resistance are rounded. The intake pipe is a single tube and has one exhaust valve per cylinder. Intake and exhaust ports as well as the manifolds are at the rear of the cylinders. Cooling fins are at the top of the head between the ports and spark plugs are so placed as to be parallel with the intake pipe, while those on the sides are concentric with the axis of the cylinder. The head is shrunk and bolted to the metal case cylinder.

Valve mechanism consists of the usual push rods and rocker arms with each rocker arm operating on two S. R. B. roller bearings and provided with Alleville lock washers for lubrication. The rocker arms and their roller bearings are mounted on a sleeve plate. These plates are housed in aluminum tubes and rocker arms are supported by and enclosed in cast aluminum alloy boxes cast at the cylinder head by these studs.

Short aluminum alloy piston rods are employed with ribs in the head running in both directions. The piston

—
Based on maximum output.

(Continued on page 1504)

Nine Companies In Consolidation

**Universal Aviation Corp. to
Render All Types of
Service**

CHICAGO, ILL.—Nine companies comprising all of the largest aeronautical engineers in the United States, with their headquarters being arranged in this city, St. Louis, and Minneapolis, are consolidating to form the Universal Aviation Corp., plans to render every type of air service. It will be principally engaged in the operation of passenger, mail, and merchandise planes over passenger routes, and will maintain a total flight distance in excess of 4,000 miles and shortly be expanded to over 2,000 miles. The corporation, jointly with the Western Air Express, has acquired control of the Southern Corporation of America, which will largely掌管 the operations to be used in the system. Flying schools have been arranged in cooperation with other air lines, railroads, and bus lines to provide transportation or carriage service over air, rail, and, or bus routes.

These Lines to be Merged

The routes to be merged are those of the Universal Air Lines, Inc., between Cleveland, Chicago, and the Twin Cities; The Roberson Aircraft Corp., Mail and Express Lines between St. Louis and Omaha; the Eastern Air Lines passenger and merchandise routes from Minneapolis to Duluth and Minneapolis and Fargo; Additional passenger and merchandise routes available for the new lines from St. Louis to Dallas, via Tulsa and from Dallas to Colorado, Colo.

Other companies in the consolidation are the Central Air Lines, Inc., between Terrell, Tex., and Dallas; the Missouri and Texas Co., Northwest Airlines, Great Air Transportation, Inc., Egyptian Airways, Inc., and Roberson Flying Schools, Inc.

Air-Rail Service Planned

The new system will operate planes in the Northwest, Middle-West and Southwest, and will have an arrangement with the New York Central, by an exchange of passengers at Cleveland, the traveling line between New York and the Twin Cities, and the lines which by 15 to 20 years ago arrangements have been concluded with the American Express Co., the Greyhound Bus Lines, and the Western Air Express to shift transportation over the Northwest. Air Lines had it in mind to make similar arrangements, but no definite plans have been made with Canadian Pacific, England, and the Sea Lines.

In addition, the company will construct flying schools in several cities, conduct selling agencies for various well known makers of planes, machine tools and

U. of M. Installs Welding Devices

MINNEAPOLIS, MINN.—More than \$40,000 worth of welding equipment to be used in the courses in aeronautical engineering at the University of Minnesota, has just been installed here. The apparatus will enable students to familiarize themselves with the methods of applying welding, the heat treatment of metals, and allied subjects of importance in aeronautical engineering.

Aero Conference Delegates Named

**Orville Wright to Be Guest
of House at Aeronau-
tique**

WASHINGTON, D. C.—A delegation of 12 members to represent the United States at the International Civil Aeronautes Conference, to be held here Dec. 13-14, has been appointed by President Coolidge. Secretary of Commerce Frank B. Kellogg has been named chairman of the group. The executive committee, as it is also known, has designated Orville Wright, also a delegate, as the guest of honor of the conference and as the representative of the government in aeronautics.

The four executive departments of the Government, primarily interested in aeronautics, will be explained on behalf of the President, are the Department of Commerce, the Department of War, the Department of the Navy and the Post Office Department. The representatives of the Government named as delegates by the President, in addition to the Secretary of War, the Secretary of the Navy and Secretary of the Marine Corps, are: Assistant Secretary of War, Howard P. Warner; the Assistant Secretary of War, W. C. Tolson; Dawson, the Second Assistant Postmaster General, Warren Irving Glavin, and the Assistant Secretary of Commerce in charge of aeronautics, William P. MacCracken, Jr.

Lindbergh Appointed

The remainder are Col. Charles A. Lindbergh, San Harlan Thompson, president of the N. A. A. National Training Fund, F. C. Clegg, R. E. G. Nichols, George E. Parker, A. S. Rogers, C. E. Wibleman, Minneapolis; Russell S. Gordon, Jr., B. O. Mahoney, John A. Lane, T. P. Proctor, Andrew G. Ladd, C. G. Gandy, and L. L. Ladd; William Chase, Pittsburgh; Frank P. Smith, Tulsa; A. Shandoroff, Fort Worth; W. L. Green, Wichita, and H. H. Barnes, Memphis.

Delegates to the special air conference on the 12th will be approximately 150,000, 800 being added through an issue of common stock which has been underwritten.

Parks Graduate to Mac Plant

ST. LOUIS, MO.—It is reported here that the new aircraft manufacturing plant of the newly formed Parks Aircraft, Inc., will be ready as far as is possible, for operation in the Parks Air College plant and machine schools.

Russell Joins Louisville Firm

LOUISVILLE, KY.—George Russell, graduate engineer, has joined the Louisville Aviation Co., located on the Shivelyville Road over the city.

Test Travel Air With Challenger

WICHITA, KAN.—This here has made available the Curtis Challenger powered Travel Air, the plane attained 335 m.p.h. with the 120 hp engine. The company now plans regular production of a three place model fitted with the 150 hp engine. The first flight test officials to believe that the craft will be popular.

Zeppelin Finishes Trip to Germany

**Breaks R-37 Revised Despite
Unfavorable Weather
or Conditions**

NEW YORK, N. Y.—Completion of the 4,300 mi flight of the Graf Zeppelin from Lakehurst, N. J. to Friedrichshafen Germany in 71 hr and 10 min was announced November 1 in a radiogram received by the Associated Press from Dr. W. A. E. Lohner, Jr., 131 W. 57th Street, New York, and headed at the German airport at 1:30 A. M. (New York time) November 1. The airship, already pressed at Friedrichshafen two hours earlier, had the landing gear collapsed and damaged. The only previous Graf Zeppelin flight in a similar way was made in the British dirigible R-34 in 1919 between Rostock Field and Farnborough, England.

It was the first time that the return trip was made in little more than one-half of the time required to reach the United States by the Aerial route, the Zeppelin was greater distance during the flight to Friedrichshafen than the R-34 had made to Canada. The Graf Zeppelin also landed in Germany. A strong storm encountered off the North Sea and Coast on the first day out continued through the night. At 10 A. M. on the way back the wind was still at 40 mi and the airship, unable to make further progress, it was driven backward.

Not Bad Weather Over France

Again the Graf Zeppelin experienced bad weather in the Bay of Biscay, the west of which was reached. While over France the airship flew through clouds and fog for four hours, a time which could not be observed from below.

At a dinner in the Karpinski Hotel in his honor on the night of his arrival, Dr. Eckener indicated that the highest-claimed record in the world was that of the Graf Zeppelin for regular commercial transoceanic service. It was inferred by his audience that while he would make regular flights across the Atlantic from time to time he would make no attempt to establish regular service over the route.

Plans Stimulated Enrollment

LOS ANGELES, CALIF.—Lee Plaza, chairman of the Los Angeles City Council of California, has announced recently that 20 new students had been enrolled on the class of the National Air Races, the majority of whom stated the class had interested them as interest to fly.

Start New Wisconsin School

WISCONSIN, MILWAUKEE.—Ted Lewis, chairman of the Los Angeles City Council of California, has announced recently that 20 new students had been enrolled on the class of the National Air Races, the majority of whom stated the class had interested them as interest to fly.

Start Work on Coffman Plant

OKLAHOMA CITY, OKLA.—General Mills has been selected for the construction of a new plant in the Oklahoma City area, at a tract owned by the Air Service Corp., adjacent to the municipal airport. Quantity production of the four basic aircraft will be started at an early date, according to Sam Coffman, managing president and designer of the plant. Dr. Coffman, a man of extensive experience in aircraft design, is to direct the plant and affine force.

Airplane Numbers Issued Reach 10,000

WASHINGTON, D. C.—This is the new record 10,000 airplane numbers in the United States, Bureau of Aircraft Regulation, Commerce. The new numbers contain no association marks for both business and pleasure aircraft.

The first record was C-28 on October 30, 1928, and the 10,000th was C-30. This plane is a 1927 Fokker C-3. The plane and its pilot, Captain C. C. Smith, were en route from the United States to Europe. The 10,000th number will make 4 necessary to run into 100,000 planes and 4 necessary to number the aircraft, a record has been stated with the 10,000th being the first to be issued. The Department of Commerce reserved the numbers 1 through 25 for use on its own planes and has reserved 100,1 to 25-1 for the same purpose.

Since C-30 has not yet been issued an effort is being made of changing the number on the plane instead of the number 25-1 has been given to Solies and Beach of round-the-world fame. The first and only solo flier known to date is Dr. M. J. and Cleveland will be transcribed immediately and written on a tag at all other points in the circuit. The radio station at the Department of Commerce and all stations will broadcast the message by radiotelephone.

Plane Network of States

The aeronautic service, forming the foundation of this new system, is based on the much richer resources gathered by the Weather Bureau throughout the United States each morning and evening in the form of the Two-City Airways, Inc., which is based at Cedar Park, Illinois. MacCloskey, the aeronautics advisor to the Bureau, has stated that the network of the aeronautic units and further supplemented by the many agents of the Weather Bureau, will be the basis for the new system. It will be organized to old and new school connection with the training school, and in said pilot McNamee to the Wisconsin Institute at Milwaukee, in which about 100 students have been identified as we are most interested.

Gets Oklahoma First Interest

OKLAHOMA CITY, OKLA.—Charles G. Gray, president of the Standard Biscuit and Muffin Co., has become a holding company and stock holder in the Southwest Airways Co. and will act as an advisory board. Dr. E. H. Tuckerman becomes general manager and Ray French chief pilot and flying instructor.

Weather Report Systems Devised

**New Arrangement to Be Tried
at New York-Chi-
cago Line**

WASHINGTON, D. C.—T. C. Heng-
bom, chief engineer of the Airways Division, Department of Commerce, announces that a new system of operating the weather communication service for night flying has been devised. Tele-
phones, radio, and other means of communication, which call for radio-
weather communication direct to the planes.

The Eastern Division of the Trans-
portation Agency, New York, Boston, and Cleveland will be the first to be operated under the new system and will have the control center located at Cleveland, from which point the Western Airway Transport Co. and American Telephone and Telegraph Co. will be in the service. The American Telephone and Telegraph Co. has arranged to install an automatic telegraph system under an agreement with the Airways Division for instantaneous communication between the two stations. Weather fields along the route, the Weather Bureau, and operations manager's office. By this system a message will be sent to a typewriter at one station and the message will be delivered to the other. The Department of Commerce reserved the numbers 1 through 25 for use on its own planes and has reserved 100,1 to 25-1 for the same purpose.

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The leading conditions at terminal and intermediate airports, together with the short range forecasts to be made, will each have on predetermined schedules. These reports will be followed by orders to pilots of airplanes in flight from the operations manager of the Transport companies.

Accident Causes Shown in Report

*Only 20 per cent. said to be
Due to Purer Pilot
Failures*

WASHINGTON, D. C.—Study of the best available data on aviation flying accidents has been made by a committee of the Society of Aviation Engineers, according to Dr. H. C. Dickenson, chief of the Heat and Power Division of the Bureau of Standards. Dickenson, the report indicates, has shown that 80 per cent. of the accidents attributed to all causes of the flight, including aerodynamic qualities.

Personnel failures and adverse flying environments account for most of the remaining accidents, while the remaining 20 per cent. are due to the aircraft. To reduce and prevent fatalities will require adherence of the latter sort, then the redesign of pilot and the management of flying fields and the avoidance of unnecessary risks.

One of the most important conclusions of the committee's analysis of the statistics is a systematic analysis of the records of accidents and power plant failures, whereby the relative safety of various engines, aircraft designs, and other components can be determined.

In order to secure and make available these data there must be full cooperation between the flying personnel, the management of flying fields, and Department of Commerce.

Utica Flying Service Named Stimson Agent

SACRUSSE, N. Y.—The General Aviation Co., Inc., Utica, New York, distributor in the state of New York of the Utica Flying Service, Inc., covering the eastern part of the state, has been appointed by the Utica Flying Service, Inc., covering the eastern part of Maine, Arkansas, Lewis and Clark.

A spokesman is also quote that Utica Aviation, Inc., Utica, N. Y., has been made a distributor representing the Utica Flying Service, Inc., in eastern Pennsylvania, including Philadelphia. William H. Viele, president of the company, has been appointed to the Utica office at Scranton, Pa., to make delivery of the first Juettner model.

The Viele company is also distributor in eastern Pennsylvania for Chittenden planes, manufactured by the Kinder-Ruston Aircraft Co., Hagerstown, Md.

Models Exhibited at Portland

PORTLAND, ORE.—An art model has won one of the displays at the Pacific International Livestock Exposition held at Portland the past two weeks. Two models, one a stylized figure, the other a steamer boat, were on display. Other plane, car, and steamship scale models, were exhibited. Pacific Air Transport Co. and Varney Air Lines incorporated in preparing and supervising the models.

Japs Studying at Fairchild Plant

FARMINGDALE, L. I.—Six Japanese students have been sent to the factory of the Fairchild Aircraft Corp. here to study aircraft construction, according to Robert O. Clegg, president of the company. The Japanese are members of a group of Fairchild aircraft distributor of American aircraft in the Orient which visits Fairchild plants through a newly-created branch of the firm.

Buy More Airplanes As Mail Load Grows

FORT WORTH, TEX.—Mail by weight the Northwest is on mail load growth. Post and air mail of 18,000 pieces of mail and 1,000 pieces of air mail were handled by the Northwest, according to W. E. Nease, Portland, representative for Varney Air Lines. This represents a 6 per cent. gain over the September total. Some 300,000 pieces were sent out by the Northwest in the month of October, according to Pacific Air Transport planes.

With the new low rate, mail loads are increasing, present flying equipment of the two companies. The P. A. T. has recently added two new Boeing planes to help with the Chaco mail.

Varney has just placed an order for two Starliner planes to be powered with Pratt & Whitney Hornets. The first is due for delivery December 1. These will replace the Boeing 247s which have been flying out to the west. Some of the smaller planes will be held for reserve use and others will be sold.

Lincoln Lines Starts Expansion Program

LOS ANGELES, CALIF.—Bettendorf Air Lines, Inc., which V. Morris, pilot and area service operator, is organizing and has been chartered at Oklahoma, with its headquarters at Tulsa, the purpose of the new organization is to expand the service of the company over the country, the ultimate inauguration of air passenger service is also planned.

Initial operation is to be started, immediately, it is said.

The company's first passenger and cargo plane, a twin-engine Cessna, will be used at the moment, and will have been placed in the service as soon as various other planes throughout the state. The new plane is to enter a ground course at the Brooks flight line.

In order to facilitate Lincoln Page and Mountain airways, the company

operates a large flying school under the supervision of Chet Dickey, chief of instruction, a former Western Air Express pilot.

Moehre Succeeds Ingraham

KICKAPOO POINT, L. I.—Lieut. A. R. Moehre, formerly attached to the naval air station at Pensacola, Fla., has been appointed commanding officer of the Standard Naval Air Station. He succeeds Lieut. Claude John Ingraham.

International Airways Buys Potomac Service

REEDLEY, WASHINGTON, VA.—Purchase of Potomac Service is now being made by International Airways, Inc. Officers of the company are C. E. Moore, president; George Walling, vice-president and treasurer; T. C. Lyons, general manager; George D. Ladd, manager of the Seattle office; James G. Nagel, secretary; and Dr. W. W. Margay, director.

Stabilized and census-taking trips, air transportation, and aerial photography are being made by Potomac Service, which recently purchased two more Boeing-powered Fairchild planes, one a five place and the other a seven place cabin monoplane. Four Englehardt and two Berliner monoplanes are used to conduct training.

The new service, which is to begin to replace the one destroyed by fire last July, is to be equipped with a fleet of six new, additional air passenger service in all planes.

International Airways, Inc., the company that purchased the Potomac Service, will continue to use the 1929 model as follows: passenger flights over Washington, Mount Vernon, and Arlington Cemetery, \$350.00; student training, \$14,000.00; cross-country flights, \$10,000.00; and other flights, \$10,000.00.

On October 1, 1938, gasoline and oil sales, express, and metal air mail service, will begin to be conducted by Pacific Air Transport.

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North American Lines Chartered in Oklahoma

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In order to facilitate Lincoln Page and Mountain airways, the company

operates a large flying school under the supervision of Chet Dickey, chief of instruction, a former Western Air Express pilot.

Wilcox Sails for Pole Base

NEW YORK, N. Y.—According to a report in the New York Times, Captain George H. Wilcox, of the Arctic Expedition has sailed from Port Clinton, Pohick Island, for December 1st. At this late point an airplane base will be established for flights over the Antarctic continent.

Trade Tips

It May Soon Return to Them...

McMULLEN, Okla., is an oil-casing distributor in a broad area of \$100,000 for the construction of a company-owned airport, the city council already having called a special election for the purpose.

—A 200 acre tract, river and ocean land, has been sold by F. P. Frazee, Oklahoma City, who has purchased two more Boeing-powered Fairchild planes, one a five place and the other a seven place cabin monoplane. Four Englehardt and two Berliner monoplanes are used to conduct training.

The Navy Department, Washington, D. C., will open a new and one-half mile long runway at the Naval Air Station, Lakehurst, N. J., and a new airport of the highest rating will be constructed, it is said.

—G. O. Jones, a pilot living there and one-half miles from Fingers Falls, N. Y., is to begin the construction of a new gas station.

—Standard Aviation, Ltd., of which E. Wilson is president, proposes to construct a new plant at Montreal, to cost about \$300,000, at Montreal, Canada.

—The Aviation Department of the City of Tulsa, Okla., is soon to take bids on the erection of a hangar at the municipal field, 8th and May, to cost about \$100,000.

—The Goodyear Zeppelin Corp., Akron, Ohio, of which K. A. Arnston is vice-president, is planning the construction of two separate hangars 180 by 200 by 250 ft.

—Capt. C. E. Spurr and C. A. Scott will develop an airport at Glendale, Calif., to be used by the Midwest Air Lines. The plan calls for a 100 by 800 ft. garage and other buildings.

—The City Commission of Jacksonville, Fla., has voted \$100,000 for enlarging the existing housing facilities at the municipal airport on the Atlantic Coast Highway.

—Hargrave and other institutions will be erected at St. Louis, Mo., by Transoceanic Air Transport, Inc., in connection with the proposed New York-Los Angeles transoceanic passenger service.

—Plans have been presented by the U. S. Air Line Corp. for a 100 by 120 ft. hangar in the airport grounds at Cleveland, Ohio. H. E. Pennington, Pennington Building Co., Inc., Mansfield, Ohio, is to submit the plans in charge.

—Cliff Henderson, aircraft director for Los Angeles, has joined the Board of Police Works to help for his new Marine Field hangar to accommodate the many firms desirous of space. The structure, he is to add, is to measure 330 by 400 ft. according to plan.

Hancock Buys Six Lockheeds

SANTA MARIA, CALIF.—The Elberry Sport Aircraft Corp. of Los Angeles, California, has purchased six Lockheed and Curtiss-Robin aircraft planes, has announced to Capt. J. Allan Hancock, owner of the Santa Maria Air Lines.

The Santa Maria Air Lines is to act as central California dealer for the Lockheed and Curtiss-Robin products, having taken delivery on its first Curtiss-Robin monoplane.

Approve Formation of Standards Association

NEW YORK, N. Y.—Establishment of the American Standards Association to succeed the American Engineering Standards Committee, has been approved by the 27 member bodies, according to an announcement by William J. Davis, assistant general manager of the Gas Appliance Co., of Indianapolis, who acted as chairman of the committee. H. G. Davis was also elected president of the new association.

One of the most important results of the abandonment of the standards committee will be the transfer of its 100,000 documents to the new association.

One of the most important results of the abandonment of the standards committee will be the transfer of its 100,000 documents to the new association. The transfer of the documents will be to the new association, which has been authorized to use the name "American Standards Association" for its publications.

The officers of the new association are as follows: Mr. S. S. Sivill, vice-president, and assistant manager, S. S. Sivill, and assistant manager, S. S. Sivill, and assistant manager, S. S. Sivill.

The advisory committee of cultural activities includes J. A. Farwell, president of the U. S. Steel Corp., chairman; George C. Gorham, president of the Commercial Airplane Division of the New York Edison Co., L. F. Lovre, president of the Deltaville and Shubroe Co., and Gerald Swanson, president of the General Electric Co.

Poughkeepsie Coast Agent

BALTIMORE, MD.—Farrand Engineers, Inc., has joined the American Engineering Standards Association to succeed the American Engineering Standards Committee, to act as its agent in the state.

—Farrand Engineers will be located at St. Louis, Mo., by Transoceanic Air Transport, Inc., in connection with the proposed New York-Los Angeles transoceanic passenger service.

—The Poughkeepsie Coast Agent for the Paragon Model Propeller Co. in the State of Louisiana.

Reviews

Reports and Memoranda of the National Bureau for Aeronautical Research, Amsterdam, Holland (Norwegian on Verschwinden was due Ryde-Innistrup) were received and forwarded to the Bureau with each report by an executive summary in English.

Report A-311—Observation of the earth in the boundary layer of the wind-tunnel with rotating cylinder.—The results of the velocity measurements in the boundary layer developed by the Royal Aeronautical Society at Farnborough are to be summarized as follows: For a cylinder of diameter 1.5 in. and a free-stream velocity of 10 ft. per second, the mean velocity profile is as follows: At the center of the cylinder, the velocity is 1.0 ft. per second; at the outer boundary of the cylinder, the velocity is 0.5 ft. per second; and at the outer boundary of the boundary layer, the velocity is 0.2 ft. per second.

With rotating cylinder, the velocity in the boundary layer of the upper surface is increased, the dissipation on the older part is reduced, and the outer boundary of the boundary layer is limited by a transition point.

Report A-312—Observation on the influence of the boundary layer on the wind-tunnel with a rotating cylinder.—The results of the velocity measurements in the boundary layer of a wind-tunnel with a rotating cylinder are to be summarized as follows: At the center of the cylinder, the velocity is 1.0 ft. per second; at the outer boundary of the cylinder, the velocity is 0.5 ft. per second; and at the outer boundary of the boundary layer, the velocity is 0.2 ft. per second.

With a rotating cylinder, the dissipation in the boundary layer is increased by a more rapid dissipation in the boundary layer than the outer part.

Report A-313—Observation on the influence of the boundary layer of the wind-tunnel with a rotating cylinder on the boundary layer of the outer part.

Report A-314—Observation on the influence of the boundary layer of the wind-tunnel with a rotating cylinder on the boundary layer of the outer part.

The results confirm the various made in Report A-311 that an important reduction is developed by the cylinder to the air in the outer part of the boundary layer of the surface, but that the direct effect is confined to a very short zone.

Report A-315—Farrand Engineers on the influence of a rotating cylinder on a wind tunnel.—This investigation is a continuation of the experiments described in Report A-311 (Vol. III). The investigation is to be conducted in a wind tunnel 10 ft. wide and 10 ft. high, the diameter of the cylinder is 1.5 in. and the free-stream velocity is 10 ft. per second. The ratio of the diameter of the cylinder to the wind speed is 1.5. The ratio of the air speed to the cylinder speed is 1.5. The results are compared with a control zone and a rotating zone.

Report A-316—Farrand Engineers on the influence of a rotating cylinder on a wind tunnel.—This investigation is a continuation of the experiments described in Report A-312 (Vol. III). The investigation is to be conducted in a wind tunnel 10 ft. wide and 10 ft. high, the diameter of the cylinder is 1.5 in. and the free-stream velocity is 10 ft. per second. The ratio of the diameter of the cylinder to the wind speed is 1.5. The ratio of the air speed to the cylinder speed is 1.5. The results are compared with a control zone and a rotating zone.

Packard
Automobiles

LAC-KARD CABLE IS CORONA PROOF

THE unusually severe service imposed upon ignition cable by modern high compression airplane engines demands a new type of cable—one that will withstand corona as well as oil fumes, moisture, and vibration.

Corona is a static electrical discharge present in all high tension systems. It releases free ozone from the air which attacks plain rubber insulated cable and very shortly impairs the dielectric strength of the insulation, resulting in a weak and delayed spark with consequent loss of power in the engine.

Packard Lac-kard Cable is the answer to this demand. The high quality rubber insulation in Packard Lac-kard Cable is protected by a stout braid which in turn is hermetically sealed by multiple coats of special pyroxylin lacquer. It is corona proof.

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term" in which only signs are placed in relation to the arrowhead as shown in Fig. 10.

In the figure, the two blocks on each side of the arrow indicate the two positions to which the orientation of the arrow is directed in 22 m. away. This system eliminates the use of rotata materials which, in actual practice, have

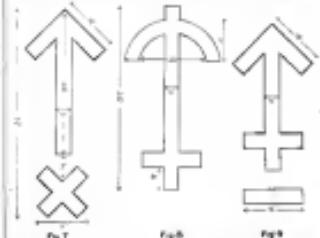


Fig. 7. An emergency landing field marker. Fig. 8 shows a simple anchorage marker, while Fig. 9 illustrates a strafeline anchorage pointer.

proved unsatisfactory, as numbers such as "E" and "W" tend to cause confusion when viewed under poor conditions of visibility.

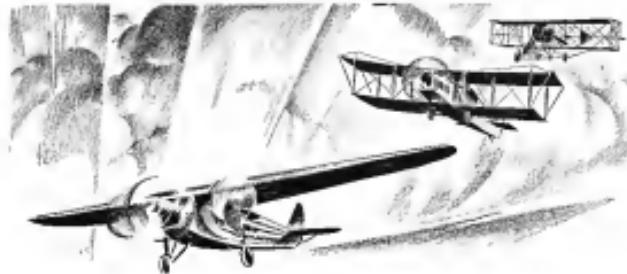
As far as weather condition signs on the airport are concerned, the use of the word "overcast" proposed by the committee is questionable and such an indicator must be morally discontinued at night. The work of weather indicating, however, will not long remain in this primitive state, as there are many other meteorological conditions of equal or greater importance to the aviator. The day is not far distant when every airport which aspires to a rating of first class will be required to equip and maintain a weather device under the direction of the central house, which will display the latest information as hand as to the weather conditions in the surrounding country to the aviator above. This can conveniently be constructed in



Fig. 10. This sketch is a marker giving the distance to a certain point through the use of the "French card system."

the form of an arrow of sufficient size to be visible at a distance, and so designed to the individual country points as to give warning of any threatened danger from any direction. For instance, this arrow may point to the northeast with a red colored arrow when extensive snow and ice is expected from that part of the compass, and the color of the arrow may change with the nature of the threatened danger, as, for example, a green arrow may indicate snow and a blue arrow dust.

Again, the need of coordinating with the airmen is often urgent, and any convenient form of units may be



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AVIATION history moves speedily. Gone already is the day of the "boxy", square-rigged biplane that pioneered the airways, it seems, only yesterday . . .

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Length	39 ft. 9 in.
Width	13 ft. 9 in.
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Useful Load	1,000 lbs.
Seating Capacity	8 Pass., 4 Pass.

Performance

High Speed (Sea Level)	111 mph
Cruising Speed	111 mph
Landing Speed	41 mph

Power Plant

Engine	Wasp
Revolutions	4,200
Fuel Capacity	100 gals
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Starter, Rotor, Metal Propeller, Camper, Air Speed Indicator, Navigation Lights, Telephones, Altimeter Clock, Tire Inflator, Fuel, Oil Reservoir, and Oil Temperature Gauge, Air Gauge Therm., Barometer and Staff Volute, Exhaust Manifold, Cabin Heater.	
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as disposed on the ground as to show by day and by night, the characteristic forms of the letters in the radio or telegraph code. With such a signal device under the control of a suitable contact mechanism in the control board, the operator, by pushing a button, any desired message may be spelled out to the stream without necessitating his landing to receive it.

It will be obvious from the foregoing remarks that the whole question of airway marking and signaling is one worthy of the best thought of the engineer, and the director of an airport will feel it profitable, as well as advisable, from an efficiency point of view, to see that his field is equipped with the ultimate in signal and marking devices.

The Velie Model L-9

(Continued from page 148)

are fitted with four $\frac{1}{4}$ in. Perfect Circle compression rings and one $\frac{1}{8}$ in. oil scraper ring. The piston pins are full floating, bearing directly on the aluminum alloy of the piston head, with a bearing at the lower end of the connecting rod. The engine's main bearing is of the big end type with bushings to provide a bearing for the crank pin. The eight articulated rods are connected to the wrist pins which are bronze bushed, all being carried in all bearings under pressure.

To permit assembly with the engine and a split type crankshaft is used. It is of the single throw counterbalanced type and is made hollow throughout its length providing oil distribution. The propeller shaft is integral with the front or lead end which also includes the crank pin and is mounted on two S. R. B. ball bearings, the forward one taking the thrust as well as the radial load.



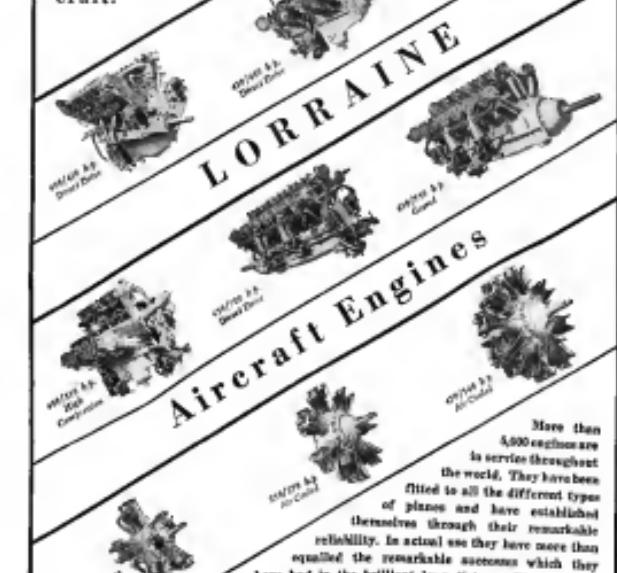
The crankshaft assembly of the Velie L-9, showing the gears, main rings, bearing and propeller shaft

The crank pin is carried completely through the rear section, and the two parts are held together by a bolt and two pins. The rear section is supported by another S. R. B. ball bearing. The propeller hub, which is standard equipment, is located by means of a keyway in the tapered shaft.

Bolted to the crankcase, which is one piece aluminum alloy casting, is a section that contains valve support guides, front main bearing and case. A gear spur on the front section of the crankshaft drives the double track case. The case flanges are one piece and are bolted to tapered gears and are assembled on an aluminum alloy hub. Each case flange has four lobes and vanes in case eight engine spans.

As previously mentioned, all necessary drives are grouped at the rear of the engine and are readily accessible. The lubricating system includes an oil pressure pump and a double scavenger pump, so that the engine can be kept free of excess oil at all times. The pressure pump forces

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Airplane buildings will have to be built better and more satisfactorily. Ask your insurance man. He will give you some valuable starting information. Good hangars of brick and steel or all steel with Kinnear Hangar Doors will secure for you the lowest insurance rate.

Build a good hangar, equip it with the best and you will have taken care of everything in the first cost. There never was a better time for building good aviation buildings than right now. The cost of maintenance on cheap buildings poorly equipped is too great. Look to the future, compare the costs and the figures will show that it is more economical to build a good hangar with good doors, than it is to build "something that will do" and lead yourself with an unbalanced up-keep.

It is good practice and good business to build a better building and eliminate costly upkeep. The constant drain of expense on operating capital has meant more than one business failure.

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Airmaster Monoplanes

(Continued from page 1486)

can be had. Two gasoline tanks, each having a capacity of 25 gal., are placed in the bays adjacent to the fuselage. Ailerons are of welded steel tube construction, hinged to triple-bowed sub-spans, and extend through approximately one-half of the span. The entire structure is faired and painted with Grade A fabric sewed through the length of each rib. The wing is doped over the cables to reduce the exterior appearance.

The Clark Y aileron section is used in the wing and in the structure of the external wing struts, which are



A wing nearing completion in the shops of the Ohio Aero Manufacturing Corp., Youngstown, O.

finished with Baltic wood and covered with fabric. This contributes to the lift of the wings. The nose strut on each side is adjustable.

As in the majority of new production planes the fuselage is constructed of welded steel tubing and is built in the form of a Warren truss. No wire tensioners are employed. The cockpit is completely enclosed and is faired, is lined with Baltic wood and covered with fabric.

Doors in each side of the fuselage afford access to the cabin, which is upholstered in a harmonizing color and comfortably furnished. Wicker seats are provided and, in the Youngster model, passenger and pilot sit side by side. In the Airmaster model the pilot's seat is in the center of the cabin and in front of the two passengers' seats located in the after part of the cabin. Ample baggage space is provided and the side windows of cluster-proof glass are so designed that they can be opened and closed easily. Unusually good visibility is provided from the pilot's position.

Instrument Panel Indirectly Lighted

All instruments required by the Department of Commerce are included in the panel, which is indirectly lighted and conveniently placed. While dust controls are not furnished as standard equipment, provision has been made for their installation in either model. The rudder is controlled by foot pedals and, like the other control surfaces, is actuated by extra flexible cable. The control surfaces have been designed to afford unusual ease of manipulation and all vital parts may be reached by uppers in the fabric covering. The wing is wired for navigation lights.

Landing gear is of the divided axle type and has a travel of 7 ft. 3 in. Part of the landing load is transmitted



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motor plane did not have a single detail of this, and more than one of them commented to me on the admirable system. Believe me, things like that will certainly pay, for nowadays people are influenced greatly by all they see.

"You might tell them that the plane is modern, that its engines are safe, its mechanics skilled, and its pilot an expert, and they will probably believe you to some extent; but let them see the plane and huddle up to the point where the passengers are waiting, its unfeared pilot restraining capability, and an air of business every where evident—and that is when you have sold something."

Of course, all transport companies have not reached the stage where they can place their pilots in uniform and spend money primarily to impress the public with their systematic operations, but there are many things which



A front quarter view of the new *Swallow Special Aerobatic*, powered with a Wright "Whirlwind" engine.

can be done at little or no expense. Planes certainly should be repaired and made ready for flight out of sight of the public, and delays in taking off after the passengers are aboard should be completely eliminated. At the larger airports, waiting rooms should be made comfortable, so that passengers will be glad to remain inside until they are signaled to embark. In that way, they are less likely to come into contact, and perhaps even more, with unscrupulous members, who are not serious, but might cause damage.

When visitors at flying fields with 10 witness operations, they should be assigned some particular spot, preferably a balcony from which they can observe flying without being so close that they interfere with the work. When there are simultaneous operations such as passenger flights, sheet tears, etc., carried on at airports from which scheduled flights depart, these operations should be arranged as far apart as possible. There will not be, of course, enough space for bypassing these inconveniences, though, although there is considerable room for improvement in this also.

It should be remembered that the first impression received by a visitor at an airport may make or lose a customer to aviation. This is especially true of an air transport service, which is scheduled, and therefore the company should live up to all that the word "scheduled" implies.

"Dressing up aviation" applies quite as fully to the airplane itself. This has already been recognized by the manufacturers, most of whom have made the refinement of aircraft products, particularly the interior of planes. In the latest flying planes, comfortable adjustable or reclining chairs are used, and there are wide vision windows, heaters and ventilators, reading lights and other furnishings, but there is still much to be done. Undoubtedly the needed improvement will be forthcoming as the wisdom of the country takes to the air. Women caused the refinement of the automobile and, as a result,

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2nd and 3rd place

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the present closed car is an example of luxury and comfort. There is little doubt that the influence exerted by women will be noted in airplane finishing and decoration within the next few years and that "cleaning up" aircraft will be the order of the day.

The California Aircraft Operators' Association

(Continued from page 1484)

In dealing with flying operations, an attempt is to be made to set this modern method of rapid transportation to the public by supplying the utmost in service. This will be accomplished by combining the service offered by railroad and bus lines with that of Flying. Many of the regular air transport already are having the way, a place will be found for the line passenger at some other airports. If a sight-seeing party is disappointed, a phone call to the aeronautics office will bring another member's equipment to the spot. In order to serve these at terminal points, certain taxicab companies are being requested to operate special cab service, employing drivers who know the location of all the airports, and the shortest routes to them from the business districts of the various California cities.

It is felt that this system of selling the most complete flying service available, making the ultimate aeronautics company best to offer, will greatly increase the total number of air passengers, and, therefore, will benefit all members of the association.

A very important part of the work, that this association hopes to accomplish, is the formulation of proper laws for aircraft regulation, and the education of the



One of the Boeing Universals operated by the Aero Corporation of California. This company is a charter member of the California Aircraft Operators' Association.

public to insure the enactment of proper legislation. If nothing else can be done, the association wants to watch the legislative program to see that no harmful measures are enacted, at least not without specificities. Authoritative figures on all phases of commercial operation will be available to legislators at all times.

The entire program is an extremely ambitious one, and it shows every indication of being immediately helpful to members of the association. It certainly will be possible to present the operator to a very large extent against unfair legislation, and there is no question of the value of the organization from a standpoint of publicity. Certainly, many serious problems of operation will be solved along.

The present president of the association are at 6940 Hollywood Boulevard, Los Angeles. Cala Jenkins, managing secretary, has expressed the desire of the organization to communicate with any similar association



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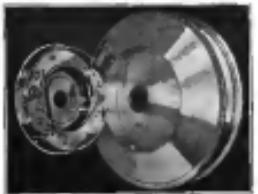
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which may be an expense, or with any operators who contemplate forming such a group.

The formative period of the Northern California Association really has been passed. The border problems of the association, formed together with operators with widely varied interests and viewpoints, has been solved. The dues are waived, so that they will not act as a deterrent in securing more members. By-laws, and legal problems in connection with dues, are being worked out by the executive committee with the advice of Mayor Teller, the association's legal advisor.

The charter members are Aero Corporation of California; Ambassador Airways, Inc.; American Airways Co.; "Bob" Blair, Dyke Airport; Jim Granger, Cal. Airlines; Maxine, Air Lines; Maxine, Inc.; Northern Aircraft Corp.; "Tod" Holden, Holden Aircraft Co.; Royce, Inc.; "Doc" Soden, and Shultz Airports.

The officers are Robert Blair, president; Jack Eys, of Aero Corporation of California; first vice-president; Norwegian Squadron of Ambassador Air Lines; second vice-president; Charles Dyke, secretary and treasurer; and Cade Jenkins, managing secretary.

Air Mail and Transport in Australia

(Continued from page 1481)

DH-50, which carries a pilot and four passengers. The planes are powered with Napier engines developing 330 hp, and have a maximum speed of 120 mph.

As a result of tenders called by the government last June, West Australian Airways secured the 1,500 sq mi air route, which is to be opened in April. This line will extend from Perth across the continent to Adelaide. On this route, stops will be made at Kalgoorlie, Forrest and Ceduna. It is interesting to note, that with the opening of the new route, the number of passengers on the existing line in the northwestern Western Australia will have approximately 2815 mi. of airways at compared with the existing 1,993 mi. of railroads.

On the Perth-Adelaide run, a dual load has been guaranteed at a price of 12s 8d per lb. The machines to be used on this route are D.H.100 "Hercules," equipped with three "Jupiter" engines. These planes have an armament of 14 passengers, and develop a high speed of 130 mph. The new line will link up with the existing boat and will connect with the two day over-the-horizon train three times a week. The period of contract is five years, and the obligation is to provide all landing fields and night lighting equipment.

About Our Paid Dividends

From a financial aspect, West Australian Airways has paid 10 per cent. dividends regularly since it began operations, although actually it has operated upon the lowest rate of subsidy paid in Australia. A number of factors have contributed toward its success. No doubt, the exceptionally fine climatic conditions, the absence of mountain ranges, and the careful selection of personnel, resulting in sound maintenance of equipment, have all played their part.

Speaking of personnel, one pilot on a regular run has accumulated over 4,000 hours. Another pilot has had more than 1,000 hours, and no one to damage his reputation is concerned. When it is realized that this pilot has encountered forced landings and other difficulties, it is a remarkable fact. Other pilots can be accredited with equally sound judgment, and such performances have greatly added to the growing public confidence. Please

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SIDE SLIPS

By ROBERT R. OSBORN

This presidential election business is now all over and out of the way. It certainly has been annoying, these last few months, to have to turn to the second or third page of the newspapers for our aviation news.

Before he left on his recent hunting trip, Colonel Lindbergh wrote a note, which was broadcast by the Republican press, stating that he was for Mr. Hoover and considered his election extremely important. Immediately, the association was made in the papers that the campaign song contest, which was run by some society or other, had been won by an effort entitled "I Want a Lindbergh For President." But George Ellery, For Mr. Hoover, the Astronomer, who was an adviser to Hoover's adviser, just stepped in to say that he had heard this song rendered, and he is sure now that the whole thing was a clever trick on the part of the Democrats.

A news item in one of the newer agricultural journals has the paragraph, "His ship is a biplane with a 100 horsepower Curtis motor. It was built by the Alexander Eagle Rock Co., Denver, Colorado. Dougherty plans to go to the mountains and fly over the Colorado and New Mexico mountains, look for Indians."

Don't laugh, boys. Don't laugh. How many of you were flying planes built completely by one manufacturer before the Department of Commerce came along and condemned the old craft?

There seems to be some mystery, yet, as to the method used by the younger generation in getting out the Zeppelin after the gash. The last word is, get out the gash, climb a tall spire far up, however, as all evidence of our experience have that gift of being able to disappear completely just when they are needed most, bobbing up and going again when it's too late to do anything about it.

We were very much disappointed to note that on another trip did the Zeppelin carry "the first electric stove to be delivered by dirigible in the history of the world." We all know that this can't be avoided much longer; it has to happen sometime soon, and we might just as well get it over with.

The other evening we were visiting at the home of a friend, who is a very prominent secessionist patent attorney. The boy of the house was playing with a very complicated and intricate airplane model, so we inquired where it came from. The father said that an old man had brought it into his office one day, saying, "Here's a model I've worked on for eight years, and I'd like to get a patent on the design." Our friend, it seemed, showed the old man a number of reasons why the ideas incorporated in the model were not patentable, and the old man had to admit to the point that the whole idea was absolutely worthless. The old gentleman shook hands with him and said, as he went out of the office, "Thanks very much. I was afraid something would be wrong with the idea. Throw the model away if you like, or give it to some kid to play with."

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